Name: Date:
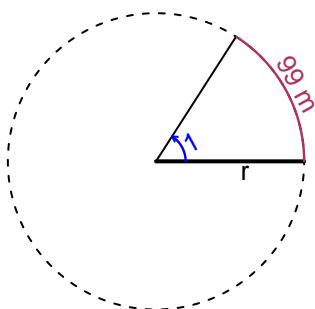
Trig Final (TEST v624)

- You can use a calculator (like Desmos)
- You should have a unit-circle with special angles and coordinates marked.
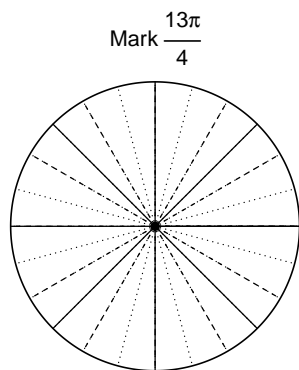
Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 1 radians. The arc length is 99 meters. How long is the radius in meters?
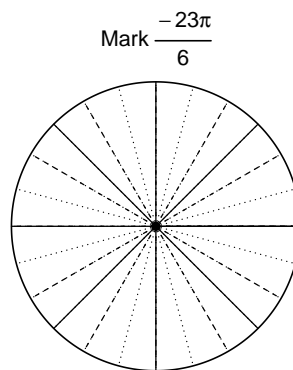

Question 2

Consider angles $\frac{13\pi}{4}$ and $\frac{-23\pi}{6}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\cos\left(\frac{13\pi}{4}\right)$ and $\sin\left(\frac{-23\pi}{6}\right)$ by using a unit circle (provided separately).

Mark $\dfrac{13\pi}{4}$

Find cos(13π/4)

Mark $\dfrac{-23\pi}{6}$

Find sin(−23π/6)

Question 3

If $\sin(\theta) = \frac{-80}{89}$, and θ is in quadrant IV, determine an exact value for $\cos(\theta)$.

Question 4

A mass-spring system oscillates vertically with a frequency of 2.85 Hz, an amplitude of 6.11 meters, and a midline at $y = 8.93$ meters. At $t = 0$, the mass is at the minimum height. Write an equation to model the height (y in meters) as a function of time (t in seconds).